

SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 15 is found on page 20, lines 27-31 of the specification. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 1-7, 9-18 and 20-21 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to an aqueous dispersion of a copolymer, a process for preparing same, a process for treating fibrous substrates, treated fibrous substrates, articles containing a treated fibrous substrate, a copolymer, methods of treating fibrous substrates with a copolymer, and processes for impregnating with an aqueous dispersion.

Applicants wish to thank Examiner Nguyen and Supervisory Patent Examiner Wu for the helpful and courteous discussion held with their U.S. representative on January 21, 2009. At that time, applicants' U.S. representative, argued the vastness of the disclosure of Danish et al. relative to the rejection for novelty and argued the results appearing in applicants' specification. The following is intended to expand upon the discussion with the Examiners.

Polymeric dispersions have been used to treat porous surfaces such as leather, textiles, paper, board, wood, concrete and bricks in order to impart properties such as water repellency, as well as softness and body. Treatments which provide water repellency as well as providing for a pleasant handling remain of interest.

The claimed invention addresses this problem by providing an aqueous dispersion of a copolymer obtained by copolymerizing at least one ethylenically unsaturated dicarboxylic anhydride, at least one oligomer of isobutene followed by reaction with an alkylene ether hydroxide. Applicants have discovered that esterification of polymerized dicarboxylic anhydride units with an alkylene ether hydroxide provide advantageous properties with respect to water repellency and durability for treated fibrous substrates of leather. Such an aqueous dispersion of copolymer is nowhere disclosed or suggested in the cited references of record.

The rejection of claims 1-10, 12-13, and 16-18 under 35 U.S.C. § 102(b) over Danish et al. (U.S. 6,336,942), of claim 15 under 35 U.S.C. § 103(a) over Danish et al., of claims 11 and 14 under 35 U.S.C. § 103(a) over Danish et al. in view of Pabst et al. (WO 03/023070) as

evidenced by U.S. 2004/0194222 and of claims 19-21 under 35 U.S.C. § 103(a) over Danish et al. in view of Keller et al. (U.S. 2002/0016433) are respectfully traversed.

None of the cited references disclose or suggest an improved water treatment while retaining leather properties for an aqueous dispersion of a copolymer as claimed.

Danish et al. discloses an aqueous solution or emulsion of copolymers obtained by polymerizing 20-95 mol% of unsaturated C₄₋₁₂ dicarboxylic acid or anhydride, 5-80 mol% of a branched oligomer or polymer having a vinyl, vinylidene or alkylvinylene terminal group and is of at least 9 carbon atoms in amounts of 0.5-70 wt%. Suitable unsaturated carboxylic acids may contain from 4-12 carbon atoms (column 2, lines 46-47). The oligomer has 9 to usually 350 carbon atoms (column 2, lines 60-62) and may include such oligomers of propene as well as C₄₀- α -olefins (column 3, lines 23-30). Solvolysis by hydrolysis and neutralization may be performed (column 6, lines 10-16) or by adding primary and/or secondary amines (column 6, lines 31-33) or even partially esterified with C₁₋₄₀ alcohols (column 7, lines 31-36). None of the examples illustrate an isobutene oligomer reacted with an alkylene ether hydroxide.

In contrast, the claimed invention is directed to a copolymer of C₄₋₈ unsaturated dicarboxylic anhydrides, isobutene oligomer having a molecular weight of 300-5,000 being reacted with an alkylene ether hydroxide. Applicants note, that the claims have been amended to specify reaction with an alkylene ether hydroxide and alkylene ether amine has been deleted without prejudice.

Applicants respectfully submit that in view of the vast disclosure of the reference in terms of the breadth of unsaturated dicarboxylic acids, olefin oligomers as well as compounds to conduct solvolysis, there is insufficient description of a copolymer of C₄₋₈ unsaturated dicarboxylic anhydrides, isobutene oligomer having a molecular weight of 300-5,000 being reacted with an alkylene ether hydroxide.

In order to anticipate a claim, the invention must be sufficiently described to have placed the claimed invention within the public possession. The failure to identify specifically C₄₋₈ unsaturated dicarboxylic anhydrides, an isobutene oligomer having a molecular weight of 300-5,000, as well as specific esterification with an alkylene ether hydroxide, would not have been selected in the absence of applicants' disclosure. Accordingly, the claimed invention is not anticipated by the reference and accordingly withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Moreover, the claimed invention would not have been obvious from the disclosure of the cited references as applicants observe enhanced water protection of a fibrous substrate using an aqueous dispersion of copolymer as claimed. The Examiner's attention is directed to Tables 2 and 3 of applicants' specification and in particular comparing the results of copolymers 7 and 8 therein.

Copolymer 7 is a copolymer of maleic anhydride and isobutene oligomer with α-C₂₀-²⁴ olefin whereas copolymer 8 is otherwise identical but subject to hydrolysis with polyethylene glycol monomethylether. For the examiner's convenience a portion of Tables 2 and 3 is reproduced below:

Table 2

No.	Copolymer	Body	Grain tightness	Softness	Water absorption 2 h	Water penetration, dynamic	Levelness of dyeing
2.1.4	7	3	2.5	3	38	1200	3
2.1.5	8	1	3	2	16	15000	2

In Table 2 copolymer 8 was evaluated as having better body and softness and also absorbed less than half of the amount of water and more than 12 times more resilient to flexion than the corresponding copolymer in the absence of alkylene ether hydroxide esterification.

Table 3

No.	Copolymer	Body	Grain tightness	Softness	Water absorption 2 h	Water penetration, dynamic	Levelness of dyeing
2.2.4	7	3.5	2.5	3.5	46	180	3
2.2.5	8	1	2	2	34	7500	2

In Table 3, the esterified sample demonstrated better body, grain tightness and softness while absorbing less water and more than 41 times more flexation prior to water penetration.

Thus, through selection of esterification with an alkylene ether hydroxide, applicants have discovered a copolymer which has enhanced properties in treatment for a fibrous substrate. As the cited reference, at best is generic to such esterification treatment, applicants' discovery of enhanced fibrous treatment properties would not have been obvious and accordingly, the claimed invention would not have been obvious.

The remaining references do not cure the basic deficiencies of the primary reference as only Danish et al. has been relied upon for disclosure of the claimed copolymer. In view of the deficiencies of the primary reference, withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

The objection to claims 4 and 17 has been obviated by amendment to recite more conventional Markush claim language.

The rejections of claims 6, 9, 15, 18 and 20 under 35 U.S.C. §101, 35 U.S.C. §112 second paragraph and objections under 37 C.F.R. 1.75(c) have been obviated by amendment to recite active process steps.

Finally the rejections of claim 16 and 18 under 35 U.S.C. §112 second paragraph have been obviated by amendment to recite "obtained by."

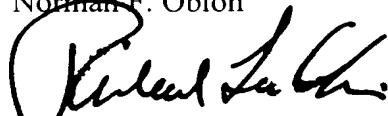
In view of applicants' amendments withdrawal of these grounds of rejection is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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